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| FORM PTO 1390 (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTORNEY'S DOCKET NUMBER ALBIHNW-397 |
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371 | | U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/701598 |
| INTERNATIONAL APPLICATION NO. PCT/SE99/00950 | INTERNATIONAL FILING DATES 1 June 1999 | PRIORITY DATE CLAIMED 2 June 1998 |
| TITLE OF INVENTION CLOTH FOR A DRY MOP | | |
| APPLICANT(S) FOR DO/EO/US Rudolf NORDIN | | |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information: | | |
| <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C 371 <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This is an express request to promptly begin national examination procedures (35 U.S.C. 371 (f)). <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c)(2)) <ol style="list-style-type: none"> a <input type="checkbox"/> is attached hereto (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). (Unexecuted) <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)). | | |
| Items 11. to 16. below concern document(s) or information included: | | |
| <ol style="list-style-type: none"> <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. w/PTO-1449, <u>3</u> references <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 & 3.31 is included. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input checked="" type="checkbox"/> Other items or information: | | |
| Copy of International Application as published | | |
| Copy of International Preliminary Examination Report | | |

EXPRESS MAIL LABEL NO. EL646756424US
 DATE: November 30, 2000

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|---|-------------------------------|--------------------------|
| U.S. APPLICATION NO. (if known, see 37 CFR 1.5) | INTERNATIONAL APPLICATION NO. | ATTORNEY'S DOCKET NUMBER |
| 09/701598 | PCT/ SE99/00950 | ALBIHNW-397 |

17. The following fees are submitted:

CALCULATIONS PTO USE ONLY**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) – (5)):**

| | | |
|--------------------------|---|------------|
| <input type="checkbox"/> | Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO . . . | \$1,000.00 |
| <input type="checkbox"/> | International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO | \$860.00 |
| <input type="checkbox"/> | International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO . . . | \$710.00 |
| <input type="checkbox"/> | International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) . . . | \$690.00 |
| <input type="checkbox"/> | International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) | \$100.00 |

ENTER APPROPRIATE BASIC FEE AMOUNT =

860.00

Surcharge of \$130.00 for furnishing the oath or declaration later than
 20 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE |
|---|--------------|--------------|-----------|
| Total claims | 4 - 20 = | | x \$18.00 |
| Independent claims | 1 - 3 = | | x \$80.00 |
| MULTIPLE DEPENDENT CLAIM(s) (if applicable) | | + \$270.00 | 270.00 |
| TOTAL OF ABOVE CALCULATIONS = | | | 1,130.00 |
| <input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½. | | | -565.00 |
| SUBTOTAL = | | | 565.00 |
| Processing fee of <u>\$130.00</u> for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). | | + | |
| TOTAL NATIONAL FEE = | | | 565.00 |
| Fee for recording the enclosed assignment (37 CFR 1.21 (h)). Assignment must be accompanied by appropriate cover sheet (37 CFR 3.28, 3.31) (\$40.00 per property). | | + | |
| TOTAL FEES ENCLOSED = | | | 565.00 |

**Amount to be:
Refunded**

Charged

- a. A check in the amount of _____ to cover the above fees is enclosed
- b. Please charge my Deposit Account No. 12-1095 in the amount of \$ 565.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. The Commissioner is hereby authorized to charge any additional fees which may be required or credit any overpayment to my Deposit Account No. 12-1095. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Lerner, David, Littenberg,
 Krumholz & Mentlik, LLP
 600 South Avenue West
 Westfield, NJ 07090
 Telephone 908 654-5000
 Facsimile 908 654-7866



Signature

ARNOLD H. KRUMHOLZ

Name

25,428

Registration Number

09/701598

PATENT
ALBIHNW 3.3-397

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of :
Rudolf NORDIN :
International Application No. : Group Art Unit:
PCT/SE99/00950 : Examiner:
International Filing Date: : Date: April 16, 2001
1 June 1999 :
For: CLOTH FOR A DRY MOP :
: X

Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Preliminary to initiation of the prosecution of the above-identified pending U.S. patent application, the following amendments and remarks are respectfully submitted.

IN THE ABSTRACT

Please delete the Abstract as filed and substitute therefor the attached revised Abstract.

IN THE SPECIFICATION

Please amend the Specification in accordance with the attached revised Specification.

IN THE CLAIMS

Please cancel claims 1-3 and add new claims 4-12.

4. (NEW) A dry mop fabric having a first surface and a second surface for cleaning soiled surfaces comprising a micro- or ultramicro-fiber having a count of from 0.60 to 0.25 DTEX per fiber, said fiber being woven so as to provide loops on at least

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one of said first and second surfaces, said loops having a height of from 3 to 9 mm.

5. (NEW) The dry mop fabric of claim 4 wherein said fiber comprises a filament.

6. (NEW) The dry mop fabric of claim 4 wherein said woven fabric comprises a knitted fabric.

7. (NEW) The dry mop fabric of claim 4 wherein said fabric is attached to a mop handle.

8. (NEW) The dry mop fabric of claim 4 wherein said loops comprise a fiber selected from the group consisting of polyamide, polyester, and mixtures thereof.

9. (NEW) The dry mop fabric of claim 8 wherein said fiber comprises a filament.

10. (NEW) The dry mop fabric of claim 4 wherein said fiber includes a cross-section which is not round.

11. (NEW) The dry mop fabric of claim 10 wherein said cross-section of said fiber is rectangular, and includes substantially flat sides.

12. (NEW) The dry mop fabric of claim 11 wherein said fiber comprises a filament.

REMARKS

The above-noted cancellation of claims 1-3, and addition of new claims 4-12, as well as the submission of a new Abstract and revisions to the Specification, are respectfully submitted prior to initiation of the prosecution of this application in the U.S. Patent and Trademark Office.

Application No. PCT/SE99/00950

The above-noted new claims are respectfully submitted in order to more clearly and appropriately claim the subject matter which applicant considers to constitute his inventive contribution. No new matter is included in these amendments. In addition, the revisions to the Abstract and Specification are submitted in order to clarify and correct the Abstract and Specification and to conform them to all of the requirements of U.S. practice. No new matter is included in these amendments.

In view of the above, it is respectfully requested that these amendments now be entered, and that prosecution on the merits of this application now be initiated. If, however, for any reason the Examiner does not believe such action can be taken, it is respectfully requested that he telephone applicant's attorney at (908) 654-5000 in order to overcome any objections which he may have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge applicant's Deposit Account No. 12-1095 therefor.

Respectfully submitted,

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK, LLP



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292599_1 DOC

09/701598

CLOTH FOR A DRY MOP

FIELD OF THE INVENTION

[0001] The present invention relates to a mop fabric designed for attachment to a mop handle and to be used to clean dry, soiled surfaces, in contrast to regular mop fabric, which is designed for immersion in a water-based washing medium and is used wet.

BACKGROUND OF THE INVENTION

[0002] Textiles have always been used for cleaning and removing dirt from soiled surfaces. These textiles have been available in various qualities, but mostly in the form of weaves. In recent times, they have consisted of fibers of natural origin such as cotton, artificial fibers such as polyamide and/or polyester, or most commonly blends of such fibers. These textiles are most often woven or knitted. It is usual for cleaning fabrics to have different-sized loops, made from various materials, which protrude from the ground fabric. An example of the type of fabric that is designed to be attached to a mop handle and used wet is described in Swedish patent no. 94 03398-2.

[0003] As a rule, satisfactory results are generally obtained with regard to the actual cleanliness of a floor when a wet mop is used to clean it. However, a film of moisture remains on the floor for some time and if anyone walks on the floor soon after it has been cleaned, it will quickly become soiled again. At the same time, the moisture adheres to the soles of the shoes and could soil other, clean surfaces if they are trodden on. In addition, there is always the inconvenience of having to use a bucket or similar container in which to carry the washing liquid when the wet-cleaning method is used. The washing liquid also consists of a mixture of water and chemical detergent, which is costly and can sometimes cause allergic reactions as well as an unpleasant odor. Water "wears out" the floor material, triggers emissions

from the material, seeps into cracks and uneven surfaces and causes the growth of bacteria and mildew.

[0004] Dirt emulsifies in water that is used for cleaning. If any of this water is left on the floor, the dirt particles will remain behind once the water has evaporated. Quite simply, the floor will not be clean.

SUMMARY OF THE INVENTION

[0005] In accordance with the present invention, these difficulties in the prior art have been overcome by the invention of a dry mop fabric having a first surface and a second surface for cleaning soiled surfaces comprising a micro- or ultramicro-fiber having a count of from 0.60 to 0.25 DTEX per fiber, the fiber being woven so as to provide loops on at least one of the first and second surfaces, the loops having a height of from 3 to 9 mm. Preferably, the fiber comprises a filament. In a preferred embodiment, the woven fabric comprises a knitted fabric.

[0006] In accordance with one embodiment of the dry mop fabric of the present invention, the fabric is attached to a mop handle.

[0007] In accordance with another embodiment of the dry mop fabric of the present invention, the loops comprise a fiber such as polyamide, polyester, or mixtures thereof. Preferably, the fiber comprises a filament.

[0008] In accordance with another embodiment of the dry mop fabric of the present invention, the fiber includes a cross-section which is not round. Preferably, the cross-section of the fiber is rectangular, and includes substantially flat sides. Most preferably, the fiber again comprises a filament.

[0009] There has therefore always been a strong desire to be able to clean a floor or similar surface by using as dry a cleaning method as possible. In accordance with the present invention, a dry-mop fabric has now been produced for attachment to a mop handle and to be used to clean dry, soiled

surfaces. This dry-mop fabric is distinguished by it consisting of micro- or ultramicro-fiber or filament with a count of 0.60-0.25 DTEX per fiber or filament and by it being woven or knitted with loops on one or both sides of the fabric, with a loop height of approximately 3-9 mm.

[0010] According to the present invention, the loops are made of polyamide or polyester fiber in various proportions, or a blend of these fibers in one and the same loop.

[0011] According to the present invention, the cross-section of the filament should not be round, but preferably have as rectangular a shape as possible, with flat sides.

DETAILED DESCRIPTION

[0012] The dry-mop fabric, according to the present invention, is designed for attachment to any mop handle and to be used to clean soiled surfaces. The mop handle is not included in the present invention; any mop handle can be used. It is of course also possible to use this dry-mop fabric without a handle by simply using the fabric on its own to clean dry, soiled surfaces by hand. If there is any water on the surface, it is naturally also possible to use the fabric, according to the present invention, to the same good effect - especially since the fabric is extremely absorbent.

[0013] The fabric consists of a ground fabric with protruding loops on one or both sides. The fabric can be woven or preferably knitted, so that the loops are firm and cannot be pulled out. The material comprising the loops should consist of micro- or ultramicro-fiber or filament with a count of 0.60-0.25 DTEX per fibre or filament. DTEX is a unit of measurement, where 1 DTEX represents one fiber with a length of 1 000 metres and a weight of 1 gram.

[0014] According to the present invention, the material of the fibers is synthetic and the loops may consist of two different materials, i.e. a number of the fibers could be polyamide, while the remainder could be polyester, for

instance. As per the invention, it is also possible that the individual loops could consist of a blend of polyamide and polyester as well as contain natural fibers.

[0015] According to the present invention, the cross-section of the filaments should not be round, but should have flat sides, preferably slanting and with as rectangular a shape as possible, whereby the fiber surface will be as large as possible.

[0016] According to the present invention, the loops should be at least about 3 mm and no more than about 9 mm in height. The most advantageous measurement is in the region of from about 6 to 8 mm. Each loop must consist of a large number of fibers. The closeness of the loops, i.e. the number of loops per unit of area, the yarn thickness and the loop height, must be proportioned so that when the fabric is pressed against an underlying surface the loops remain upright or lie at an angle of no more than 45° to an imaginary vertical line. The force indicated in this instance is the normal weight of the mop handle plus some strength exerted by the operator, who holds the mop and moves it forwards. This maximum angle means that the part which is in contact with the underlying surface largely consists of transverse fibers. Because of the position, flatness and closeness of the fibers across the entire surface of the mop, a propulsive effect on the dirt particles or other impurities arises. The particles are attracted to and accumulate on the fiber surfaces, as well as between the fibers and inside the loops. The relatively high loop height combined with the collectively large fiber surface contributes to its ability to accumulate a large quantity of grime or dirt particles.

[0017] The cleaning action is highly effective because of the microfibers' extreme softness, the length and closeness of the loops and the count and surface dimensions of the fibers . Even though the fibers are soft and the loops are long, the

loops will still not be flattened out because they support each other owing to their closeness. Since every surface is more or less uneven and the fibers in the mop fabric adapt to the unevenness of the underlying surface and force their way into even extremely small hollows, the fabric can also remove and accumulate the very small particles that are deposited in these uneven areas.

[0018] By combining the various parameters according to the present invention, an extremely high-quality dry-mop fabric with extensive cleaning ability has been produced.

[0019] Because of its great ability to absorb liquids and particles it should, in principle, also be possible to use the mop for drying up liquid, with simultaneous absorption of both the water and any emulsified dirt contained in it.

[0020] Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

ABSTRACT OF THE DISCLOSURE

Dry mop fabrics are disclosed for cleaning soiled surfaces which include micro- or ultramicro-fibers having a count of from 0.6 to 0.25 DTEX per fiber, with the fiber being woven so as to provide loops on at least one side of the fabric, with the loops having a height of from 3 to 9 mm. Preferably, the fibers comprise filaments and the woven fabric is a knitted fabric.

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09/701598

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CLOTH FOR A DRY MOP

TECHNICAL FIELD: OF THE INVENTION

[0001] The present invention concerns relates to a mop fabric that is designed for attachment to a mop handle and to be used to clean dry, soiled surfaces, in contrast to regular mop fabric, which is designed for immersion in a water-based washing medium and is used wet.

BACKGROUND: OF THE INVENTION

[0002] Textiles have always been used for cleaning and removing dirt from soiled surfaces. These textiles have been available in various qualities, but mostly in the form of weaves. In recent times, they have consisted of fibres fibers of natural origin such as cotton, artificial fibres fibers such as polyamide and/or polyester, or most commonly blends of such fibres fibers. These textiles are most often woven or knitted. It is usual for cleaning fabrics to have different-sized loops, made from various materials, which protrude from the ground fabric. An example of the type of fabric that is designed to be attached to a mop handle and used wet is described in Swedish patent no. 94 03398-2.

THE TECHNICAL PROBLEM:

[0003] As a rule, satisfactory results are generally obtained with regard to the actual cleanliness of a floor when a wet mop is used to clean it. However, a film of moisture remains on the floor for some time and if anyone walks on the floor soon after it has been cleaned, it will quickly become soiled again. At the same time, the moisture adheres to the soles of the shoes and could soil other, clean surfaces if they are trodden on. In addition, there is always the inconvenience of having to use a bucket or similar container in which to carry the washing liquid when the wet-cleaning method is used. The washing liquid also consists of a mixture of water and chemical detergent, which are is costly and can

sometimes cause allergic reactions as well as an unpleasant ~~odor~~ odor. Water "wears out" the floor material, triggers emissions from the material, seeps into cracks and uneven surfaces and causes the growth of bacteria and mildew.

[0004] Dirt emulsifies in water that is used for cleaning. If any of this water is left on the floor, the dirt particles will remain behind once the water has evaporated. Quite simply, the floor will not be clean.

THE SOLUTION:

SUMMARY OF THE INVENTION

[0005] In accordance with the present invention, these difficulties in the prior art have been overcome by the invention of a dry mop fabric having a first surface and a second surface for cleaning soiled surfaces comprising a micro- or ultramicro-fiber having a count of from 0.60 to 0.25 DTEX per fiber, the fiber being woven so as to provide loops on at least one of the first and second surfaces, the loops having a height of from 3 to 9 mm. Preferably, the fiber comprises a filament. In a preferred embodiment, the woven fabric comprises a knitted fabric.

[0006] In accordance with one embodiment of the dry mop fabric of the present invention, the fabric is attached to a mop handle.

[0007] In accordance with another embodiment of the dry mop fabric of the present invention, the loops comprise a fiber such as polyamide, polyester, or mixtures thereof. Preferably, the fiber comprises a filament.

[0008] In accordance with another embodiment of the dry mop fabric of the present invention, the fiber includes a cross-section which is not round. Preferably, the cross-section of the fiber is rectangular, and includes substantially flat sides. Most preferably, the fiber again comprises a filament.

[0009] There has therefore always been a strong desire to be able to clean a floor or similar surface by using as dry a

cleaning method as possible. In accordance with the present As per the invention being presented, a dry-mop fabric has now been produced for attachment to a mop handle and to be used to clean dry, soiled surfaces. This dry-mop fabric is distinguished by it consisting of micro- or ultramicro-fibre or filament with a count of 0.60-0.25 DTEX per fibre or filament and by it being woven or knitted with loops on one or both sides of the fabric, with a loop height of approximately 3-9 mm.

[0010] According to the present invention, the loops are made of polyamide or polyester fibre in various proportions, or a blend of these fibres in one and the same loop.

[0011] According to the present invention, the cross-section of the filament should not be round, but preferably have as rectangular a shape as possible, with flat sides.

DETAILED DESCRIPTION OF THE INVENTION:

[0012] The dry-mop fabric, as per according to the present invention being presented, is designed for attachment to any mop handle and to be used to clean soiled surfaces. The mop handle is not included in the present invention; any mop handle can be used. It is of course also possible to use this dry-mop fabric without a handle by simply using the fabric on its own to clean dry, soiled surfaces by hand. If there is any water on the surface, it is naturally also possible to use the fabric, as per according to the present invention, to the same good effect - especially since the fabric is extremely absorbent.

[0013] The fabric consists of a ground fabric with protruding loops on one or both sides. The fabric can be woven or preferably knitted, so that the loops are firm and cannot be pulled out. The material comprising the loops should consist of micro- or ultramicro-fibre or filament with a count of 0.60-0.25 DTEX per fibre or filament. Dtex-DTEX is a

unit of measurement, where 1 DTEX represents one fibre-fiber with a length of 1 000 metres and a weight of 1 gram.

[0014] As per According to the present invention, the material in-of the fibres-fibers is synthetic and the loops may consist of two different materials, i.e. a number of the fibres-fibers could be polyamide, while the remainder could be polyester, for instance. As per the invention, it is also possible that the individual loops could consist of a blend of polyamide and polyester as well as contain natural-fibres-fibers.

[0015] As per According to the present invention, the cross-section of the filaments should not be round, but should have flat sides, preferably slanting and with as rectangular a shape as possible, whereby the fibre-fiber surface will be as large as possible.

[0016] As per According to the present invention, the loops should be at least about 3 mm and no more than about 9 mm in height. The most advantageous measurement is in the region of from about 6- to 8 mm. Each loop must consist of a large number of fibres-fibers. The closeness of the loops, i.e. the number of loops per unit of area, the yarn thickness and the loop height, must be proportioned so that when the fabric is pressed against a-an underlying surface underneath it the loops remain upright or lie at an angle of no more than 45° to an imaginary vertical line. The force indicated in this instance is the normal weight of the mop handle plus some strength exerted by the operator, who holds the mop and moves it forwards. This maximum angle means that the part which is in contact with the underlying surface underneath largely consists of transverse-fibres-fibers. Because of the position, flatness and closeness of the fibres-fibers across the entire surface of the mop, a propulsive effect on the dirt particles or other impurities arises. The particles are attracted to and accumulate on the fibre-fiber surfaces, as well as between the

~~fibres~~fibers and inside the loops. The relatively high loop height combined with the collectively large ~~fibre~~fiber surface contributes to its ability to accumulate a large quantity of grime or dirt particles.

[0017] The cleaning action is highly effective because of the ~~microfibres~~microfibers' extreme softness, the length and closeness of the loops and the count and surface dimensions of the ~~fibres~~fibers. Even though the ~~fibres~~fibers are soft and the loops are long, the loops will still not be flattened out because they support each other owing to their closeness. Since every surface is more or less uneven and the ~~fibres~~fibers in the mop fabric adapt to the unevenness of the underlying surface underneath and force their way into even extremely small hollows, the fabric can also remove and accumulate the very small particles that are deposited in these uneven areas.

[0018] By combining the various parameters as per the according to the present invention being presented, an extremely high-quality dry-mop fabric with extensive cleaning ability has been produced.

[0019] Because of its great ability to absorb liquids and particles it should, in principle, also be possible to use the mop for drying up liquid, with simultaneous absorption of both the water and any emulsified dirt contained in it.

[0020] The invention is not limited to the design described, but can be varied in different ways within the scope of the patent claims. Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit

and scope of the present invention as defined by the appended
claims.

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PCT/SE99/00950

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CLOTH FOR A DRY MOP.

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TECHNICAL FIELD:

The present invention concerns a mop fabric that is designed for attachment to a mop handle and to be used to clean dry, soiled surfaces, in contrast to regular 15 mop fabric, which is designed for immersion in a water-based washing medium and is used wet.

BACKGROUND:

Textiles have always been used for cleaning and removing 20 dirt from soiled surfaces. These textiles have been available in various qualities, but mostly in the form of weaves. In recent times, they have consisted of fibres of natural origin such as cotton, artificial fibres such as polyamide and/or polyester, or most 25 commonly blends of such fibres. These textiles are most often woven or knitted. It is usual for cleaning fabrics to have different-sized loops, made from various materials, which protrude from the ground fabric. An example of the type of fabric that is designed to be 30 attached to a mop handle and used wet is described in Swedish patent no. 94 03398-2.

THE TECHNICAL PROBLEM:

As a rule, satisfactory results are obtained with regard 35 to the actual cleanliness of a floor when a wet mop is used to clean it. However, a film of moisture remains on the floor for some time and if anyone walks on the floor

5 soon after it has been cleaned, it will quickly become soiled again. At the same time, the moisture adheres to the soles of the shoes and could soil other, clean surfaces if they are trodden on. In addition, there is always the inconvenience of having to use a bucket or
10 similar container in which to carry the washing liquid when the wet-cleaning method is used. The washing liquid also consists of a mixture of water and chemical detergent, which are costly and can sometimes cause allergic reactions as well as an unpleasant odour. Water
15 "wears out" the floor material, triggers emissions from the material, seeps into cracks and uneven surfaces and causes the growth of bacteria and mildew.

Dirt emulsifies in water that is used for cleaning. If
20 any of this water is left on the floor, the dirt particles will remain behind once the water has evaporated. Quite simply, the floor will not be clean.

THE SOLUTION:

25 There has therefore always been a strong desire to be able to clean a floor or similar surface by using as dry a cleaning method as possible. As per the invention being presented, a dry-mop fabric has now been produced for attachment to a mop handle and to be used to clean
30 dry, soiled surfaces. This dry-mop fabric is distinguished by it consisting of micro- or ultramicro-fibre or filament with a count of 0.60-0.25 DTEX per fibre or filament and by it being woven or knitted with loops on one or both sides of the fabric, with a loop
35 height of approximately 3-9 mm.

- 5 As per the invention, the loops are made of polyamide or polyester fibre in various proportions, or a blend of these fibres in one and the same loop.
- As per the invention, the cross-section of the filament should not be round, but preferably have as rectangular
- 10 a shape as possible, with flat sides.

DETAILED DESCRIPTION OF THE INVENTION:

- The dry-mop fabric, as per the invention being presented, is designed for attachment to any mop handle
- 15 and to be used to clean soiled surfaces. The mop handle is not included in the invention; any mop handle can be used. It is of course also possible to use this dry-mop fabric without a handle by simply using the fabric on its own to clean dry, soiled surfaces by hand. If there
- 20 is any water on the surface, it is naturally also possible to use the fabric, as per the invention, to the same good effect - especially since the fabric is extremely absorbent.
- 25 The fabric consists of a ground fabric with protruding loops on one or both sides. The fabric can be woven or preferably knitted, so that the loops are firm and cannot be pulled out. The material comprising the loops should consist of micro- or ultramicro-fibre or filament
- 30 with a count of 0.60-0.25 DTEX per fibre or filament. Dtex is a unit of measurement, where 1 DTEX represents one fibre with a length of 1 000 metres and a weight of 1 gram.
- 35 As per the invention, the material in the fibres is synthetic and the loops may consist of two different materials, i.e. a number of the fibres could be

5 polyamide, while the remainder could be polyester, for instance. As per the invention, it is also possible that the individual loops could consist of a blend of polyamide and polyester as well as contain natural fibres.

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As per the invention, the cross-section of the filaments should not be round, but have flat sides, preferably slanting and with as rectangular a shape as possible, whereby the fibre surface will be as large as possible.

15

As per the invention, the loops should be at least 3 mm and no more than 9 mm in height. The most advantageous measurement is in the region of 6-8 mm. Each loop must consist of a large number of fibres. The closeness of
20 the loops, i.e. the number of loops per unit of area, the yarn thickness and the loop height must be proportioned so that when the fabric is pressed against a surface underneath it the loops remain upright or lie at an angle of no more than 45° to an imaginary vertical
25 line. The force indicated in this instance is the normal weight of the mop handle plus some strength exerted by the operator, who holds the mop and moves it forwards. This maximum angle means that the part which is in contact with the surface underneath largely consists of
30 transverse fibres. Because of the position, flatness and closeness of the fibres across the entire surface of the mop, a propulsive effect on the dirt particles or other impurities arises. The particles are attracted to and accumulate on the fibre surfaces, as well as between the
35 fibres and inside the loops. The relatively high loop height combined with the collectively large fibre

5 surface contributes to its ability to accumulate a large quantity of grime or dirt particles.

The cleaning action is highly effective because of the microfibres' extreme softness, the length and closeness
10 of the loops and the count and surface dimensions of the fibres. Even though the fibres are soft and the loops are long, the loops will still not be flattened because they support each other owing to their closeness. Since every surface is more or less uneven and the fibres in
15 the mop fabric adapt to the unevenness of the surface underneath and force their way into even extremely small hollows, the fabric can also remove and accumulate the very small particles that are deposited in these uneven areas.

20

By combining the various parameters as per the invention being presented, an extremely high-quality dry-mop fabric with extensive cleaning ability has been produced.

25

Because of its great ability to absorb liquids and particles it should, in principle, also be possible to use the mop for drying up liquid, with simultaneous absorption of both the water and any emulsified dirt
30 contained in it.

The invention is not limited to the design described, but can be varied in different ways within the scope of the patent claims.

35

10 PATENT CLAIMS:

1. Dry-mop fabric for attachment to a mop handle and designed to clean dry, soiled surfaces, characterized in it consisting of micro- or ultramicro-fibre or filament with a count of 0.60-0.25 DTEX per fibre or filament and by it being woven or knitted with loops on one or both sides of the fabric, with a loop height of 3-9 mm.
- 20 2. Dry-mop fabric according to patent claim 1, characterized in the loops being made of polyamide or polyester fibre or a blend of these fibres in one and the same loop.
- 25 3. Dry-mop fabric as per patent claim 1 or 2, characterized in the cross-section of the filament not being round, but preferably having a rectangular shape with flat sides.

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATIONATTORNEY'S DOCKET NO.: ALBIHN W 3.3-397

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: CLOTH FOR A DRY MOP, the specification of which is attached hereto. was filed on 1 June 1999 as United States Application Number or PCT International Application Number PCT/SE99/00950 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed:

| PRIOR FOREIGN APPLICATION(S) | | | |
|------------------------------|--------------------|--------------------------------------|---|
| COUNTRY | APPLICATION NUMBER | DATE OF FILING (month, day, year) | PRIORITY CLAIMED |
| Sweden | 9801946-6 | 06-02-1998 | YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> |
| | | | YES <input type="checkbox"/> NO <input type="checkbox"/> |
| | | | YES <input type="checkbox"/> NO <input type="checkbox"/> |

LISTING OF FOREIGN APPLICATIONS CONTINUED ON PAGE 3 HEREOF YES NO

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

Application Number: _____

Filing Date: _____

Application Number: _____

Filing Date: _____

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s), or § 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

U.S. Parent Application Serial Number: _____ Parent Filing Date: _____ Parent Patent No.: _____

U.S. Parent Application Serial Number: _____ Parent Filing Date: _____ Parent Patent No.: _____

PCT Parent Number: _____ Parent Filing Date: _____

LISTING OF US APPLICATIONS CONTINUED ON PAGE 3 HEREOF: YES NO

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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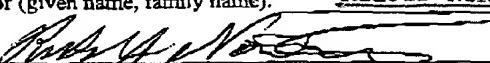
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DECLARATION -- Page 2**ATTORNEY DOCKET NO. ALBIHN W 3.3-397**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Full name of eighth joint inventor, if any (given name, family name): _____

Eighth Inventor's signature _____ Date _____

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